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# USSR Report

ENERGY

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## ELECTRIC POWER

### HISTORY OF ELECTRIFICATION IN UZBEK SSR

Tashkent KOMMUNIST UZBEKİSTANA in Russian No 12, Dec 80 pp 49-54

Article by A. Khamidov, Minister of Power and Electrification, Uzbek SSR: "Implementing Leninist Ideas on Electrification in the Uzbek SSR: The Sixtieth Anniversary of the State Plan for the Electrification of Russia (GOELRO)"

Text As early as the middle nineteenth century when electricity was scarcely out of the laboratory, K. Marx and F. Engels accurately predicted the enormous future of electrification. In a discussion with Karl Liebknecht in 1850 K. Marx said: "the reign of mighty steam, which has changed the world in the past century, has come to an end. It has been replaced by an immeasurably more revolutionary force - the electrical spark. Now the problem has been solved and the consequence of this fact cannot be estimated. The necessary consequence of the economic revolution will be a political revolution, because the latter is only an expression of the first." In the extensive use of electric power K. Marx and F. Engels saw the source of profound changes, which have a revolutionary influence not only on technology but on all aspects of public progress.

V. I. Lenin recognized the important role of electrification in the creation of the material-technical base of a classless society. In 1920 on Lenin's initiative the world's first long-range plan was drawn up to develop a national economy on the basis of electrification. The GOELRO plan was approved by the Eighth All-Russian Congress of Soviets, which met in December 1920. In speaking at this congress about the work of the VTSIK /All-Russian Central Executive Committee/ and the Sovnarkom, Lenin called the GOELRO plan the Party's second program, thereby advancing his historical formula "Communism is Soviet power plus the electrification of the entire nation."

In truth, the tendency of man's social-economic development confirms the correctness of the Marxist-Leninist teaching about electrification as the most important material basis for profound changes in public production, conditions of labor and living of people. In the past 25 years alone the daily output of electric power in the world has increased 6-fold and now exceeds seven trillion kilowatt-hours. Today

there is no sector of public production or even a small economic undertaking that does not make use of electric power. The per capita output and consumption of electricity and the power available to labor are viewed as critical synthetic indicators which characterize the technical level of the national economy of any state and the degree of development of its production forces.

In subsequently implementing Lenin's ideas, the Soviet people under the leadership of the Communist Party have achieved enormous successes in the electrification of the Soviet Union. It suffices to say that in accordance with the decisions of the 25th CPSU Congress in the Tenth Five-Year Plan at electric power stations new power capacities were put into operation, which equal those that were put into operation during the first 40 years of Soviet power. This year the production of electric power will exceed one trillion 300 billion kilowatt-hours. In the current five-year plan important measures were taken to further increase the technical level and efficiency of Soviet power engineering. It is being developed on the basis of concentrating and centralizing the production of electric and thermal power, using more economical power resources, the construction of large electric power stations and super high-voltage power transmission lines, the comprehensive use of hydroelectric power resources, increasing the pace of equipping atomic electric power stations and adopting the automation of technological processes. Most of the growth in capacities at thermal electric power stations at present is being accomplished by installing power units with a rated capacity of 300, 500 and 800 thousand kilowatts; at atomic electric power stations the power units are rated at one million kilowatts.

In the Uzbek SSR in the Tenth Five-Year Plan capacities were put into operation in excess of 2.1 million kilowatts. Twenty-thousand kilometers of power transmission lines were built. In 1980 the consumption of electric power in the Uzbek SSR will reach 36.5 billion kilowatt-hours.

The electrification of pre-revolutionary Turkestan was at an extremely low level. In 1913 the rated capacity of electric power stations within present-day Uzbek SSR was 3,000 kilowatts and the output of electric power was 3.3 million kilowatt-hours. By the time the GOELRO plan was compiled, the rated capacity of electric power stations in Turkestan, which were largely in Tashkent, was so insignificant that it was impossible to consider supplying electric power to adjacent regions. The GOELRO plan called for the construction of one hydroelectric power station. The construction of the first large hydroelectric power station in the Uzbek SSR began in 1923 on the Bozsu canal, just outside of the city of Tashkent.

Thanks to the comprehensive assistance of the Party and government, the selfless work of the republic's workers under the leadership of the Uzbek SSR Party organization incredible difficulties were overcome. The difficulties were caused by the ruin and the shortages of skilled personnel, financial resources, construction materials and equipment. On

In May 1926 the first section of the Bozsuyeskaya hydroelectric power station was put into operation with a rated capacity of 2,000 kilowatts; subsequently the rated capacity of this hydroelectric power station was increased to 4,000 kilowatts. A cable network was built simultaneously which carried an alternating current of 6 kilovolts to 30 transformer points. The cable network linked the hydroelectric power station with an existing diesel streetcar electric power station. This was the beginning of the formation of the Uzbek SSR's power system.

In 1928 the third assembly of the Bozsuyeskaya hydroelectric power station was put into operation. The Samarkand diesel electric power station and electric power stations in Termez, Bukhara, Karshi, Margilan, Kokand and other cities were built.

The Fourth Party Congress of the Uzbek SSR (February-March 1929) called upon the republic's Party organization to increase its attention toward the development of electrification. As early as 1929 the production of electric power in the Uzbek SSR reached 34.3 million kilowatt-hours, having exceeded the pre-revolutionary level by 10.4-fold; and the rated capacity of the electric power stations increased during this period 4.1-fold and reached 12,300 kilowatts.

During the First Five-Year Plan to supply electrical and thermal power to the Fergana oil plant they built a thermal electric power station with a rated capacity of 2,000 kilowatts. Later in connection with the growing need for thermal and electric power the rated capacity of the thermal electric power station was increased to 8,300 kilowatts. The basis for the development of the Fergana power system was the Fergana thermal electric power station, Zarya Vostoka, which supplied electric power to a textile factory, the Kuvasayskiy cement plant and other consumers. During this same time the Kadyr'inskaya hydroelectric power station (near Tashkent) with a rated capacity of 13,200 kilowatts was put into operation.

In 1933 four electric power stations with a total rated capacity of 28,100 kilowatts and an output of electric power of 126,400,000 kilowatt-hours were combined to form Uzbekenergo [Uzbek SSR Power Authority]. In addition, in Samarkand, Andizhan, Namangan, Kokand, Bukhara, Kagan and Uchkurgan city diesel electric power stations were built or expanded. Power stations were also installed at cotton gins and at oil mills.

In 1939 the thermal electric power station of the Tashkent textile combine with two central heating turbines of 6,000 kilowatts each and the Kuvasayskaya GRES [State Regional Electric Power Station] with one condensation assembly with a rated capacity of 12,000 kilowatts were put into operation. The Kuvasayskaya GRES and the Fergana TETS [thermal electric power station] formed the Fergana power system. In 1940 the powerful Komsomol'skaya (now the Chirchiksaya) GES [hydroelectric power station] provided current; and 1941 the Tavaksayskaya GES became operational. In 1940 the rated capacity of the Uzbek SSR's electric power stations was 171,000 kilowatts and the output of electric power was 484,000,000 kilowatt-hours.

During WWII more than 90 percent of industrial enterprises were moved from regions that were temporarily occupied by the fascists to the Uzbek SSR. The republic's Party organization led the struggle of the workers of the Uzbek SSR to rapidly put power capacities into operation to supply these enterprises with power. Seventeen thousand kolkhoz workers went to work on the construction of electric power stations in 1942. They served as examples of Soviet patriotism and demonstrated a high political and labor activity. As a result 15 new electric power stations were built and put into operation.

During the difficult years of the war construction got underway on the first GES on the Syrdar'ya River - the Farkhadskaya GES, which marked the start of the comprehensive use of this river. High-speed national methods were used to erect the GES. Thousands of workers from the cities and rayons participated in this construction. By the fall of 1942 75,000 men were working on the project. In 1948 the Farkhadskaya GES was put into operation. This electric power station with a rated capacity of 126,000 kilowatts made it possible to further develop the power and chemical industries and, in particular, to expand the Chirchikskiy electrochemical combine and to significantly improve the combine's power supply system. It has also given impetus to the development of the coal industry and nonferrous metallurgy.

Following the war the electrification of the Uzbek SSR's national economy was even further expanded. The rated capacity of all Uzbek SSR electric power stations in 1950 was 528,100 kilowatts, a 3-fold increase when compared with 1940 and a 176-fold increase when compared with 1913. The production of electric power increased from one billion 187 million kilowatt-hours in 1945 to 2 billion 682 million kilowatt-hours in 1950. The assignments of the Fourth Five-Year Plan on electric power output were overfulfilled.

The then largest Angrenskaya GRES occupied a primary position in the program for the construction of power projects of the Fifth and Sixth five-year plans, both in national economic importance and in amount of capital investments. On 4 November 1956 the first assembly of the GRES with a rated capacity of 50,000 kilowatts was put into operation; and by the end of 1958 the rated capacity of the GRES was increased to 200,000 kilowatts.

The Uzbek SSR's first 220 kilovolt power transmission line connected the Kayrakkumskaya GES with Tashkent. It was put into operation in 1957. Afterward these 220 kilovolt electric power transmission lines formed an electrical link between the Angrenskaya GRES and the cities of Almalyk and Tashkent.

The total rated capacity of the Uzbek SSR's electric power stations in 1958 was 1,196,000 kilowatts - nearly 400 times more than in 1913; and the output of electric power increased during this period by more than 1,420 times. On a per capita basis 585 kilowatt-hours of electric power were produced. The titanic work of the Uzbek SSR's Party organization in mobilizing workers to fulfill the Party's assignments and those of the government and the selfless labor of the builders played a decisive role in expanding the republic's electric power base.

During this period two power systems - the Tashkent and the Fergana - were functioning in the Uzbek SSR. They supplied a centralized power source for the basic consumers of Tashkent Oblast and the Fergana valley. The other oblasts, cities and rayons received electric power from a large number of isolated electric power stations with a small and average rated capacity.

A key factor, which influenced the development of power engineering in the republics of Central Asia and Southern Kazakhstan, was the discovery in the Uzbek SSR of rich deposits of natural gas near Bukhara. This led to the construction of gas and fuel oil electric power stations - the Tashkentskaya and the Navoiyskaya GRES's. The first assemblies at these electric power stations were put into operation in 1963.

For the electrification of the lower reaches of the Amudar'ya River in the Karakalpakskaya ASSR the Takhiatashskaya GRES was built with a rated capacity of 48,000 kilowatts. After the Bukhara-Urals gas pipeline was put into operation, the Takhiatashskaya GRES was switched to gas and hooked into this gas pipeline.

In 1962 the union-republic Ministry of Power and Electrification of the Uzbek SSR was formed. The concentration within the system of this ministry of the republic's power management, the conduct of a unified equipment policy in the production and distribution of electric power, the designing, construction and operation of electric power stations and networks made it possible to significantly pick up the pace of electrification, to steadily expand the areas of utilization of electric power in all sectors of the national economy and to increase its output.

In 1965 the production of electric power increased over 1958 by 2.5-fold and amounted to 11 billion 500 million kilowatt-hours. In 1958 the hydropower stations provided more than 70 percent of all electric power output, and in 1965 the GES's provided only 22 percent of all electricity.

A significant amount of work has been done to provide electricity to agriculture in the Uzbek SSR. While in 1958 agriculture used 226 million kilowatt-hours of electricity, in 1965 it consumed 894 million kilowatt hours.

In accordance with the Directives of the 13th Party Congress in regard to the Eighth Five-Year Plan the construction of the Tashkentskaya and Navoiyskaya GRES's has been continued in the Uzbek SSR. At these two stations alone for the five-year plan more than 1.5 million kilowatts of capacities have been put into operation. Such high rates for introducing generating capacities were made possible by increasing per-unit capacities, the extensive mechanization of construction-installation work, and, chiefly, due to the constant attention of the republic's Party organization toward the construction of electric power stations.

During the Eighth Five-Year Plan new capacities were implemented at the Takhiatashskaya GRES and the Ferganskaya TETS to supply heat and steam to the Fergana nitrogen fertilizer plant and the first assembly of the

Charvakskaya GES was activated. As is known, the Charvaksaya GES is very important to the Tashkent economic region. It has made it possible to improve the supply of water to 300,000 hectares of irrigable land and to irrigate 150,000 hectares. The average annual output of the GES will be nearly two billion kilowatt-hours of electric power. Due to the work of the hydroelectric station it has become possible by overshooting the flow to increase the production of electric power at power stations located further down the Chirchik River during the winter to 170 million kilowatt-hours. The Charvakskoye reservoir has prevented possibly destructive floods and has made it possible to create an excellent area for recreation of the residents of Tashkent and other industrial centers.

During the construction of the Uzbek SSR's large electric power stations the intensive construction of electrical networks has continued. During the five-year plan the stretch of electric power transmission lines with a voltage of 35 kilovolts and more has increased by more than 4,000 kilometers, or 75 percent. This includes mainline 220 kilovolt networks, which increased 2-fold.

In April 1969 the Central Committee of the Uzbek SSR Communist Party and the Uzbek SSR Council of Ministers studied the electrification of agriculture in the republic. The decree that they issued called for a sharp increase in the rates of construction of rural electrical networks and the completion in 1971 of the electrification of the houses of agricultural workers, which was fulfilled within the established time period.

In the Ninth Five-Year Plan the total rated capacity of the Uzbek SSR's electric power stations increased by nearly 3 million kilowatts and reached 6.7 million kilowatts. The output of electric power in the republic increased by 15.3 billion kilowatt-hours; in other words, in 1975 in the Uzbek SSR more electric power was produced than was produced in the entire USSR in 1936.

During the Tenth Five-Year Plan new capacities were put into operation at the Syrdar'inskaya and Navoiyskaya GRES's, the cascade of the Middle Chirchik hydroelectric power stations and the 500 kilovolt mainline electric power networks, which join the Nurekskaya GES in the Tajik SSR with the Toktogul'skaya GES in the Kirghiz SSR, and the Tashkentskaya and Syrdar'inskaya GRES's.

Governed by the decisions of the 25th Party Congress, the subsequent Plenums of the CPSU Central Committee and the instructions of the General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev, the power engineers and workers of the Uzbek SSR - the designers, builders, installers and operational workers are doing their utmost to successfully fulfill and overfulfill the plan of the concluding year of the Tenth Five-Year Plan and to ensure a steady supply of power to consumers. A power unit with a rated capacity of 210,000 kilowatts has already been put into operation at the Navoiyskaya GRES, with a rated capacity of

300,000 kilowatts at the Syrdar'inskaya GRES. Installation work on the hydroassembly with a rated capacity of 40,000 kilowatts at the Gazalkentskaya GES is nearly completion.

Today the basis is being created to further develop the Uzbek SSR's power potential in the Eleventh Five-Year Plan. Work on the Novo-Angrenskaya GRES is moving right along. The new city of the power workers, Nurabad, is growing.

Construction work has gotten underway on the Talmardzhanskaya GRES. In a few years a power giant with a rated capacity of 3,200,000 kilowatts will rise in the Karshinskaya steppe.

In the Eleventh Five-Year Plan the Tashkentskaya GRES will not only produce electric power, but will also provide heat for the city's day-to-day needs. This combined method of producing electricity and heat will make it possible to significantly reduce fuel expenditures.

In addition, the Navoiyskaya and Takhiatashskaya GRES's will be expanded. On the map of the Uzbek SSR there will be new power transmission lines and 220 and 500 kilovolt substations. The construction of secondary links will substantially increase the reliability and stability of the power system.

Proud of the achieved successes and promising future, the power workers of the Uzbek SSR clearly acknowledge that there are shortcomings in the power system. The more complete use of power capacities, improving the operating mode of the equipment, increasing the quality and reducing the time periods of repair work and utmost conservation of fuel resources - these are the reserves of production that must be immediately put into effect.

A new impetus to the development of initiative and creativity among the Uzbek SSR's power workers was provided by the decree of the CPSU Central Committee "Concerning the socialist competition for a worthy greeting of the 26th Party Congress". The appeal of the Central Committee to follow the example of the initiators of the competition and to commemorate the Party congress with high labor results struck a responsive note among the builders, installers and operational workers at the Syrdar'inskaya GRES. They have pledged to put the final, ninth power unit with a rated capacity of 300,000 kilowatts into operation prior to the convening of the Congress, which is four months ahead of schedule.

At this time the power workers of the Uzbek SSR, as are all workers of the republic, are preparing to greet the 26th Party Congress and the 20th Party Congress of the Uzbek SSR in a manner true to the spirit of Lenin.

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## ELECTRIC POWER

### DEVELOPMENT OF ATOMIC POWER STATIONS IN THE UKRAINE

Kiev RABOCHAYA GAZETA in Russian 27 Jan 81 p 2

/Article by A. N. Makukhin, minister of the UkrSSR Ministry of Power and Electrification: "Power Engineering Today and Tomorrow" /

/Text/ Among the key national economic tasks for the Eleventh Five-Year Plan in the draft of the CPSU Central Committee for the 26th Party Congress, special emphasis is put upon the further development of power engineering. A. N. Makukhin, UkrSSR Minister of Power and Electrification, tells the RATAU /Radio and Telegraph Agency of the Ukraine/ correspondent about the promise and trends in the development of this sector in the Ukrainian SSR.

Last year Lenin's GOELRO plan was 60 years old. In looking back to the time when the Soviet Union had just started electrification, today's successes in power engineering can be seen very clearly. This sector of the economy has changed beyond measure, having become the very foundation of the entire national economy. Evidence of this fact are the figures which characterize the development of power engineering in the Ukrainian SSR. The total capacity of electric power stations has reached 43.8 million kilowatts and the branched electric power network is now more than 800,000 kilometers, having more than doubled the distance from the earth to the moon. During the Tenth Five-Year Plan the production of electric power increased by 22 percent and reached 237 billion kilowatt-hours.

Electric power stations with a rated capacity of two and more million kilowatts, of which there are nine in the Ukraine, have become common. Among the largest - and not just in the Ukraine but in Europe - are the Zaproszhskaya and the Uglegorskaya GRES's /state regional electric power stations/ with a rated capacity of 3.6 million kilowatts. The Zuyevskaya GRES is the next to be put into operation.

In the Eleventh Five-Year Plan the sector will be developed even more rapidly. In 1985 the Ukraine must reach 290 billion kilowatt-hours of electric power output.

/Question/ And will atomic electric power stations provide a significant portion of this growth?

[Answer] Almost all of it. The output of electric power at AES (atomic electric power station) must be increased 5-fold, which will make it possible to free more than 110 million tons of coal, the extraction of which, as is known, is becoming complicated, for the national economy. The increase in capacities at the Chernobyl'skaya and Rovenskaya AES's will continue; and it is planned to put the first assemblies into operation at the Yuzhno-Ukrainskaya, Khmel'nitskaya, Zaporozhskaya and Krymskaya (Crimean) AES's.

Atomic electric power stations will also help to solve the problems of power-and-heat generation, desalination of water and the production of hydrogen, which may become one type of fuel for transport.

Work is in full swing in the construction of the Odesskaya atomic TETS (thermal electric power central). The completion of the ATETS will make it possible to shut down no less than 400 small boilers, which are polluting the environment of the resort city.

A new step toward concentrating production and raising the economy of the sector is the creation of power complexes, which combine atomic power stations, hydraulic power stations and hydraulic accumulator power stations. Such systems are expected to solve the problem of the overdistribution of loads during peak-hours. They will help to extend the service life of equipment and to conserve quite a bit fuel.

The first such power complex in the Soviet Union is the Yuzhno-Ukrain-skii complex, which is being built on the Yuzhnyy Bug River. In addition to the Yuzhno-Ukrainskaya AES, the power complex will include the Konstantinovskaya GES (hydroelectric power station) - the GAES (State atomic power station) and the Tashlykskaya GES. It is these power giants that are determining the nature of tomorrow's power engineering.

[Question] What about the distant future of power engineering?

[Answer] In that case we are speaking of non-traditional sources of thermal and electric power. The most powerful and, if you will, inexhaustible sources are solar energy, wind energy, tidal energy and the heat of the earth's interior. In the Crimea the first Soviet solar electric power station will be built with a rated capacity of 5,000 kilowatts; a similar power station with a rated capacity of 200,000 kilowatts is being designed. Scientific-research is underway to use geothermal water in the Carpathian Mountains, where there is an abundance of such water.

We are now looking for ways to convert heat directly into electricity, which will make mechanical converters, turbines, and generators unnecessary and will increase the reliability of the system. In particular, scientists have already proposed an experimental magnitohydrodynamic power plant with a rated capacity of 25,000 kilowatts.

[Question] Considering the enormous importance attached to conservation in the draft of the Basic Trends, I would like to know about the contribution of power engineers to realizing the planned tasks.

[Answer] The thrifty, rational use of each gram of fuel is held by our workers to be a vital matter. During the Tenth Five-Year Plan, for example, the relative expenditure of fuel per kilowatt-hour of electric power was reduced by 9 grams, which gave the national economy more than 5 million tons of standard fuel in addition.

While preparing for the winter maximum loads at each enterprise measures were taken to raise the reliability and economy of the power units, technology was improved and, where necessary, equipment was renovated.

Considerable reserves of economy exist in the area of consumption. Where the production workers have established control over the expenditure of power resources in each shop, sector, work space, the fuel conservation accounts are growing. The collectives of the associations Zhdanovtyazhmasch, Zaporozhtransformator, the Odessa cable plant, the Dnepropetrovsk combine plant and others can serve as an example in this regard.

At many industrial enterprises the conservation indicators are reflected in conditions of competition and in collective contracts. This will also promote observation of consumption limits for electric and thermal power and their rational use.

It is worth mentioning that a large part of the output of power resources is used to meet the day-to-day needs of the workers. The Party and trade union members and workers of the housing and municipal services can do quite a bit to ensure that this national possession is used wisely in all places.

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## ELECTRIC POWER

### CONSTRUCTION DELAYS, OTHER PROBLEMS CONTINUE AT ATOMMASH

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 30 Jan 81 p2

Article by V. Pershin, deputy minister of Power Machine Building and general director of the Atommash Production Association, Volgodonsk, Rostovskaya Oblast: "Power Engineering: Eliminating Disproportions"

Text During the Eleventh Five-Year Plan it is proposed to put into operation from 24 to 25 million kilowatts of new capacities at atomic electric power stations. The Atommash plant has been called upon to play an important role in solving this task.

In December 1979, the builders and installers cooperated closely with plant workers to complete work on the second section of the enterprise. Thus, the power machine builders have received capacities, which enable them to each year produce casing equipment for atomic power stations for 4 million kilowatts.

At the plant an initiative has come into being, which is briefly expressed in the slogan "We will build and assimilate ahead of schedule". In spite of the difficulties during the construction of the collective, the Atommash workers within a short period of time have mastered such complicated technological processes as the automatic and manual welding of metal with a thickness up to 280 millimeters, anticorrosion coating, thermal treatment, the mechanical processing of large and important parts of reactor equipment and all methods of nondestructive control. At the enterprise strictest technological discipline has been maintained, which has made it possible from the very beginning to ensure a rather high quality and reliability of the product that is being manufactured. A comprehensive system of product quality control and the automated production control system have helped to speed up the assimilation of production capacities. Having studied the experience of leading Soviet and foreign enterprises, the plant management and Party committee have adopted a management structure, which most fully corresponds to the nature of the production of reactor equipment using unique fixed assets. The essence of this structure rests in the maximum centralization of management functions in the hands of the directors of each production facility.

These and other measures permit the collective to successfully fulfill a very taut socialist obligation - to manufacture the first Donskoy

reactor by the opening of the 26th Party Congress, which is six months ahead of the established schedule. In this manner, the many thousands of workers of the plant and its Party organization will demonstrate their readiness to provide in the Eleventh Five-Year Plan the series production of equipment for atomic electric power stations.

Very important tasks have been placed on our shoulders. During the Eleventh Five-Year Plan Atomnash is obliged to supply equipment with the VVER-1000 type reactors to the Yushno-Ukrainskaya, Kalininskaya, Rostovskaya and other atomic power stations - a total of seven units. In the Twelfth Five-Year Plan the plant must manufacture 6 - 7 units each year, and by 1990 it must be able to produce 8 units per year. What is more, we are speaking about the manufacture of only assembled equipment.

To handle these tasks, it is necessary to correctly plan the assimilation of production capacities and to strictly observe planned time periods. The problem is that equipment for an AES [atomic electric power station], which goes into the total unit, has various technological cycles. Thus, the reactor housing is manufactured in 644 days, the steam generator takes 463 days, the system for controlling the shielding takes 390 days, and the compartment takes 374 days. Therefore, the enterprise must be built so that the production facilities which manufacture units and assemblies is constructed first since it has the longest technological cycles. Buildings for the production of articles with a shorter cycle can be constructed somewhat later, but within time periods that would permit all equipment to be manufactured and delivered to the AES in the full amount and prior to the planned time.

In practice, however, the construction time periods of the second section of Atomnash have been disrupted for the majority of the construction projects. The first section of building 2 which is to produce systems for controlling the shielding was to have been put into operation in 1980. But its completion date has been moved to 1981. The second section of building 1, with a floor space of 120,000 square meters and which is to manufacture overload machinery, separators of superheaters and other equipment, was also to have been completed in 1980. In actuality, this important project will be completed only this year. We have been unable to fully complete building 6 and the start-up unit of building 4 on a timely basis. The time periods for the construction of the repair-construction shop and other projects have been completely disrupted.

As a result, of course, the time periods for manufacturing the equipment needed to assemble atomic power stations are being delayed. In the warehouses a significant amount of technological and lifting and transport equipment has accumulated, which cannot be installed anywhere.

The Atomnash plant is being constructed as a large, social-industrial complex. It includes, in addition to production capacities, housing units, health care facilities and cultural facilities, child-care facilities, sports facilities, consumer and municipal services and a

subsidiary agricultural facilities. In this approach to the creation of a new enterprise we see the specific implementation of the Party line to provide for the overall well-being of the Soviet people.

To implement this program a great deal has already been done: In Volgodonsk an entire city has been created with multi-storey buildings and spacious avenues and streets. However, even in the construction of housing and facilities for consumer services there has been a considerable lag: since the start of the construction of Atomnash there has been a shortfall of 148,000 square meters of housing space and only 68 percent of the funds for municipal construction have been assimilated. None of the planned cultural facilities has been completed.

The construction lag at the industrial and living projects can be explained by the same reasons: an acute shortage of workers within the general contracting construction organization - the Volgodonskenergostroy [Volgodonsk power construction trust] of the USSR Ministry of Power and Electrification; the lack of the needed motor transport; disruptions in the supply of timber, carpentry articles, reinforced concrete, crushed stone, and so forth.

The USSR Ministry of Power and Electrification has powerful construction organizations. They have successfully erected many power projects in the Soviet Union. They constructed such outstanding enterprises as the Volga and Kama motor vehicle plants. It is amazing that for the construction of Atomnash, the supplier of equipment for atomic electric power stations, the ministry has neither the needed attention nor the material resources.

The Rostov Oblast Party Committee is helping us a great deal. Representatives from the city of Rostov and many other cities of the oblast are participating both in the construction of the plant itself and of the housing, dormitories, and children's pre-school institutions. While experiencing a shortage of transport means, the oblast regularly sends large-capacity trucks to assist the Volgodonskenergostroy Trust. But this is not enough to complete the construction of the plant in the Eleventh Five-Year Plan. We need the significant efforts of the USSR Ministry of Power and Electrification, as the general contractor, the USSR Ministry of Heavy and Transport Machine Building, and Atomnash itself, as the customer, which is obliged to provide the project with technical documentation, equipment and financing, as well as many other ministries and departments. The slogan "Atomnash is being built by the entire nation" remains topical in the Eleventh Five-Year Plan.

For this reason it is necessary to clarify the wording of the tenth section of the draft of the Basic Trends, where it says: "To put into operation capacities at the Atomnash plant". In our opinion, this phrasing should read: "In 1981-1985 to put into operation at the Atomnash plant projects in the nomenclature and within time periods ensuring the timely putting into production and output of assembled equipment for atomic electric power stations."

However, there is one more problem, which determines the rates of assimilating production capacities at the Atomnash plant. This is the shortage of forging billets and sheet metal. In order to fully load the production facility that has already been put into operation, we must by 1 January of this year have seven complete sets of billets for the casing equipment. In actuality, the plant has only four complete sets. The problem is that the supplier, the Izhora Plant Production Association, is unable to fill orders for steel from Atomnash and other customers.

This is how things stand today. But when Atomnash is fully developed, it will consume 100,000 tons of metal per year. Where can it be gotten? Involving the Kramatorsk Plant Energomashpetstsal' in solving this problem will not radically change the situation. Particulary since right next to the Atomnash plant in Volgodonsk there is a large metallurgical plant Energomash, the basic purpose of which is to provide leading enterprises of power machine building with forge and press billets. However, the construction of the Energomash plant is proceeding very slowly - so far only 4 million rubles worth of construction and installation work has been assimilated.

In our opinion, the Basic Directions should require the completion of the first section of the Energomash plant in the Eleventh Five-Year Plan and the overall completion of the enterprise prior to 1990. The Basic Trends should also require the completion of the first section of the thick sheet-metal mill, the Kvartsa-5000, at the Izhora Plant Production Association.

In this manner the disproportions in the development of Atomnash will be eliminated and the conditions will be created to provide atomic power stations with assembled equipment on a timely basis.

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CSO: 1822

## ELECTRIC POWER

COMMUNIST PARTY, SOUTHERN UKRAINIAN AES 32 PRAISED

Kiev RADYANS'KA UKRAYINA in Ukrainian 3 oct 80 p 1

[Article by A. Nen'ko, deputy party committee secretary: "Under party group control"]

(Text) The primary party organization of construction management of the Southern Ukrainian AES-32 is the party groups comprised of more than 300 communists. Most of the lower-echelon party centers have been acclaimed the vanguard of labor collectives. Active in the densest populations—crews, shops, shifts—they mobilize the workers to shock work and carry out excellent propaganda work.

For example, this is true of the party members of a large prefab home construction plant where V. Krivoruchko is the party group organizer. The communists were able to monitor the performance of all technological processes in the manufacture of modular reinforced concrete, and led the socialist competition to complete the quotas of the 10th Five-Year Plan ahead of schedule. The results were obvious. In a short time the plant surmounted delays and individual shops successfully reached their planned capacities.

The party groups in the Donbasenergobudtrans automobile manufacturing association come well recommended. Communists monitor the flow of the automobile production lines and report on the work of test drivers during trips. They lead a steadfast struggle to enhance labor productivity and satisfaction of complete quotas and socialist obligations. The success of party group activity primarily depends on the activities of the party group organizer. The enterprise's party bureau carefully saw that the duties of party group organizer were fulfilled by the most scrupled, business-like communists. Critical assignments were given to Anatoliy Kosov, auto electrician Oleksandr Prokushev, senior mechanic Oleksandr Bakurov. In order to make their work easier, the party organization arranged a study of party group organizations. This has a successful impact on the manufacturing process and worker training.

So, at industrial shop #8, all was not well with the quality of welding being done on reinforced modular units destined for construction of equipment rooms. The members of the party group decided to monitor this problem. Communists in mechanized labor administration took on the primary task of monitoring the quality of repairs and efficiency of utilization of construction technology.

8617  
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## ELECTRIC POWER

### SOUTHERN UKRAINIAN AES PASSES MILLION RUBLE MARK

Kiev RADYANS'KA UKRAYINA in Ukrainian 3 Oct 80 p 1

[Article by V. Polishchuk, chief fitter of the Southern Ukrainian group Donbasatomenergomontazh: "Strategy of the Million Boundaries"]

(Text) Early in the year I was able to participate in a meeting of leaders of construction shock work in the republic taking place in Komsomolsk. I recall a conversation with colleagues from various corners of the Ukraine about work. Most of them told me about the reserves for increasing labor productivity. Why only about that? Because only an improvement in that indicator can show the way toward high yield and to the greatest output of each team member.

After a meeting at the Dneprovsk Mining and Concentration Combine we spent a long time advising the crew how to best exceed the output of the prior year. Usually, it is difficult for 33 workers to complete assembly work worth 1,700,000 rubles within a year. They overcame that limit in 1979. What about 1980? The comrades in the crew encouraged me and together we elaborated a strategic plan to conquer the million ruble mark. They decided to fully use our reserves: large modular assembly, high labor discipline, intensification of economic conditions, improvement of labor quality, increased qualification of fitters, total interchangeability.

This strategy was justified. In assembling components of the mechanical room of the Southern Ukrainian AES over a million rubles worth of work was completed in nine months of 1980. That million didn't come easily. Credit is primarily due to masters of their craft such as Petro Goncharuk, Tsezar Koholodets'kiy, Volodymyr Solovey, Fedir Ostapchuk, Oleksandr Pichugin, Vasil' Skripka, Volodymyr Kolomiyets', Petro Polishchuk, Mikola Verbits'ky and many others.

We had to work under complex conditions: first the designs were delivered, then the supplies. For example, we had begun to hang the wall panels. Just as soon as we picked up speed, delivery of components stopped. We had to switch to other jobs. Then we found that something was wrong with the blueprints.

We also wasted a lot of time making up for shortages and defects. Then we also had to do work which should have been done at the plant during manufacture of the components or at ground-level during their reinforcement. When the mechanical room was up, we found out that the roof girder trusses had to be reinforced. How could this be done when they were already in place? We had

to take people away from their main jobs, send them up more than 30 meters high, balancing between the cross says, to reinforce the truss plates.

I feel that our architects and planners must pay more attention to the quality of their blueprints. When we put the Seal of Quality on them and examine the paperwork together, and plant managers meet their obligations to supply components for the facility, then we the filters will make our promises. And I am sure we will not exaggerate.

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## ELECTRIC POWER

### DELAYS IN CONSTRUCTION OF THE SOUTHERN UKRAINIAN AES

Kiev RADYANS'KA UKRAYINA in Ukrainian 3 Oct 80 p 2

(Article by the traveling editor of RADYANS'KA UKRAYINA: "Breaks in the graph")

[Text] The three tremendous man-made reservoirs—atomic, hydraulic, and hydraulic accumulating plants—together represent a unique energy complex which will produce several billion kilowatts of electrical energy per year. It is being constructed at full speed; in five years more facilities have been completed than at the Rovno and Smolensk AES together.

The start-up boiler plant, a large prefab home construction plant, a powerful industrial base have already been erected and the blueprints are being drafted for a possible city of builders and engineers. The major facilities of the AES are being put up: the reactor building, mechanical building, reactor vessel, chemical purification equipment, engineering laboratory, sanitation facilities and residential buildings, etc.

The words "for the very first time" were heard more than once at the construction site. A "million" kilowatt reactor will be used here for the first time in the land, in conjunction with a one million kilowatt turbine and generator. For the first time engineers have to solve complex problems of simultaneous erection of an AES, GAES and GES and to resolve an entire series of problems related to the construction of the energy complex. Those words not only evoke pride among the construction workers assigned to carry out the complex operations, but they also increase the responsibility of all participants in this important task.

Unfortunately, some links in the chain do not harken to their responsibility. The directors, the construction administration of the Southern Ukrainian AES and subcontracting organizations permitted serious delays to occur in assembling the main industrial facilities of the first energy plant, including the reactor building, mechanical building, reactor vessel, hydraulic technology, residences and other recreational facilities.

During our conversation, N. Stulin, head engineer of construction administration, suggested these examples. During 1979 the working blueprints of the equipment building and mechanical building were altered more than once. As a result, three thousand additional tons of metal were required. The same thing happened this year. Changes and additions are inserted in the planning documents nearly every day. Perhaps the planners of the Kharkov division of the All-Union Institute Teploelektroprojekt feel the southern Ukrainian AES is unique. "In the

"process" of construction some changes have to be made. But it is impossible to rely on that all the time. Problems with the working blueprints interfere with construction technique and produce a lack of rhythmic flow and rush work.

Construction is also fouled up by late delivery of equipment, metal components, reinforcement and construction materials. The Dneprodzerzhinsk Metallurgical Plant interrupts metal deliveries month after month. For three quarters it was supposed to send 900 tons of rolled metal sheet, but it only met 15 to 20 percent of the quota. Enterprises of the Donbasenergobudindustriya association did not deliver the 760 cubic meters of reinforced concrete components. The Kostyantynovskiy High Voltage Equipment Plant did not deliver high voltage breakers. The Baglyovskiy Plant fouled up the delivery schedules on nonstandard equipment.

Subcontractors often let down the construction workers. Sometimes, without even informing the general contractor, they shift experts from one site to another. In particular, that is what the Pivdenteploenenergomontazh association did. Just when the work is ready for the fitters, they remove the experts to other facilities. They basically left the administrators and several dozen fitters who could not meet the planned work quota under the best organizational conditions.

Even neighbors often let you down. V. Osipov, crew chief of Belaz drivers of the branch of Donbasenergobudtrans informed us:

With good organization we could conduct 18-20 test runs per shift, but we only do 1/5 or 1/6 of that. This is what happens: eight Belazes arrive, but only two of the excavators are working and the scoops are sent for repair. Excavator operators often have to sit around because of a lack of electrical energy. In the mechanical building we saw a group of workers using jack hammers and crushers to dig a foundation for a turbine plant.

"The geodesists of the construction management got all worked up", V. Glembovsk'yy, deputy head of the turbine exploitation shop, morosely answered our question. "The foundation supports were too far toward the generator and the outlet nozzles of the turbine did not fit.

"Our crew can not borrow knowledge and mastery," tells S. Shutov, head fitter of the Gidromontazh shop. "And because of poorly organized delivery of components by the railroad, they often have to sit around.

The general contractor, Donbasenergobud association, also does not set a good example for the subcontracting organizations. The responsible subcontractors, especially the construction managements of the Mironov, Krivoy Rog, Voroshilovgrad and Kurakhov DRES, month after month do not meet the production quota because of a shortage of skilled personnel. The management of Krivoy Rog changes the roster of construction crews every month, leading to defective work and shoddy technological and labor discipline.

V. Fuks, director of the Southern Ukrainian AES, states that at every meeting he says that users and construction workers should stop blaming each other and work together more harmoniously. But in fact, the directors often let the fitters down. After all, because of the lack of output controls on the technical justifications, planning paperwork is often delayed, many numerical errors are permitted in the plans, and fundamental changes later have to be made. This leads to additional expenditures. It's nice that the directors worked hard to get the equipment delivered. But unfortunately, they don't care whether this equipment arrives at the construction site in the proper order of construction. A significant portion of the expensive equipment stands out in the open for months and the immediately necessary equipment is still in shipment.

The party organization of the AES construction management is now taking steps to see that the atomic energy complex is erected according to plan. The shortcomings will only be eliminated when all organizations responsible for erecting the Southern Ukrainian AES work in close cooperation, something still lacking here.

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## ELECTRIC POWER

### START-UP OF REACTOR AT ROVENSKAYA AES

Moscow IZVESTIYA in Russian 25 Dec 80 p 1

Article by V. Vladimirov, Rovno: "The Reactor is in Operation"

/Text/ The start-up of the first reactor of the Rovenskaya atomic power station /AES/ has taken place. The power unit has a rated capacity of 440,000 kilowatts and has provided current to the high-voltage lines that lead to the new atomic city, Kuznetsovsk from all sides.

The creation of such a power station on the forested side of the western Ukraine is among the key national economic tasks for the further development of power engineering. The industrial potential of nearby cities has risen considerably. Their names can be seen in the trademarks of vehicles, machine tools, chemical products and instruments. The LEP's /electric power transmission lines/, which carry electric power to the CEMA nations, pass through these areas.

The creators of the Rovenskaya AES had to pass an examination for maturity and mastery. The problem is that their AES is the first of a new generation of electric power stations based on a nuclear fuel and is a model for subsequent stations. The heart of the first unit is a water-cooled reactor of a new series, which operates on thermal neutrons. Many other features are unique. Let us note one of them - the cooling tower, which has become the architectural center of the station. More than 12,000 tons of precast and monolithic concrete were poured into its shell to a height of 150 meters. The cooling tower will cool 100,000 cubic meters of water per hour. It is no accident that the annals of the competition at the large project record the names of hundreds of leading workers of various specialities, who demonstrated labor enthusiasm.

Just as other stations that use nuclear fuel, the Rovenskaya AES promises a noticeable economic effectiveness. In a calculation for a year the AES's completed power unit will provide the same amount of current that a common state regional electric power station would generate by burning a million tons of coal.

At this time the builders in Kuznetsovsk are carefully studying the draft of the Basic Directions for the Development of the Soviet Union. In

the Eleventh Five-Year Plan and in the following years they must increase the rated capacity of their AES. After installing the second unit with the same rated capacity they must install the next - at a million kilowatts. There is a lot of work ahead.

8927  
CSO: 1822/100

## ELECTRIC POWER

### CONSTRUCTION OF ROSTOVSKAYA AES

Moscow SOTSIALISTICHESKAYA INDUSTRITA in Russian 4 Jan 81 p 1

(Article by V. Bondarenko, TASS correspondent, Volgodonsk, Rostovskaya Oblast: "Work at the Construction Site is Picking Up Speed")

(Text) At a depth of two and a half meters below the level of the Tsimlyanskoye Sea the builders of the Rostovskaya AES (atomic power station) greeted the new year of 1981. In the gigantic trench on the high coast of the manmade reservoir the workers of the Volgodonskenergostroy trust (Volgodonsk Power Construction Trust) have driven in the first drill-packing pilings under the foundation of the reactor section, having fulfilled one and a half annual plans for the industrial construction of the AES.

This project is among the key construction undertakings in the draft of the CPSU Central Committee for the 26th Party Congress. The Rostovskaya AES is being erected in accordance with the new draft, by which such large power projects of the next five-year plan are being created. Among these projects are the Balakovskaya, Zaporozhskaya and other atomic power stations.

"In four years the AES will provide the Soviet Union with power," said the deputy manager of the Volgodonskenergostroy Trust, A. S. Shurytin. "The importance of the new AES to the national economy is demonstrated by the fact that the Novocherkasskaya thermal electric power station, which is the largest in the south of the Russian Republic, requires 7 million tons of coal each year, but provides three times less power than the future Rostovskaya AES, which in addition does not pollute the environment."

Aleksey Stepanovich Shurytin built the Krasnoyarskaya hydroelectric power station, KamAZ (Kama Truck Plant) and Atomnash (atomic power machine building plant). He speaks with knowledge about the fact that the new unified draft will make it possible to reduce labor expenditures by 20 to 30 percent. The planners have incorporated all the best that they learned in constructing reactors - they have improved the configuration of the equipment. In turn, the builders are preparing to use the most progressive methods, which were proven in the record-time completion of Atomnash, to build the AES. In particular,

they are making provision for a coagulant assembly of reinforced concrete structures and installation units weighing as much as 100 tons, the extensive use of the brigade contract and the development of competition on the principle of "workers' relay race". The experience in building Atommash will help Volgodonskenergostroy to significantly reduce accepted time periods for constructing an AES.

In placing 14-meter pilings into the ground, the workers skillfully handle the mechanical hammers in the trenches of special housing and the reactor section. At the site of the future machine room the bulldozers are still working. Along a new two-lane road, which linked the project with Volgodonsk, speed the tractor trailers loaded with reinforced concrete sections. To the right, a forest of structures recedes to the horizon.

The construction project in the steppe is picking up speed.

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## ELECTRIC POWER

### RESPONSE TO ARTICLE ON TRANSPORT PROBLEMS IN POWER SECTOR

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 13 Jan 81 p 2

/Letters from V. Gin'ko, deputy minister of railways, and V. Budennyy, deputy minister of power and electrification, USSR: "Echo of Our Articles: Exceptions Without Rules"/

/Text/ The Ministry of Railways has carefully studied the questions that were raised in V. Selyunin's article "Exceptions Without Rules" (9 October 1980). In view of the tense situation in the fuel and power and transportation complex, we first of all make note of the particular importance and timeliness of the newspaper article. The MPS /Ministry of Railways/ fully agrees with the author: the elimination of cross hauling and excessively long distance and other irrational shipments of coal, reinforced concrete structures and other cargoes will ease the burden on the railroads and, most important, will make it possible to better meet the needs for shipments.

These questions we have repeatedly put before the USSR Gosplan and the USSR State Committee for Material and Technical Supply; however, as can be seen in the records and analysis of economic ties, the problem is still not being solved in the needed manner. For example, Soyuzglavugol' /Main Administration for Interrepublic Deliveries of Coal/ under the USSR State Committee for Material and Technical Supply and the USSR Ministry of Power and Electrification are not taking the necessary steps to introduce rationality into shipments. As a result over the past five years the average distance for delivering coal has increased by more than 100 kilometers. This has increased transportation work by approximately 80 billion ton-kilometers and every 24 hours ties up more than 30,000 gondola cars, keeping them from carrying other, no less important cargoes.

Through no fault of the author there was an error in the article: it stated that the transportation department of the USSR Gosplan, in forbidding excessively long-distance shipments of precast reinforced concrete, did not take into consideration a single protest from the adherents of the departmental self-supply approach. In reality, according to data for 10 November, i.e., one month after publication of the article, the USSR Gosplan ordered the MPS to transport precast structures for a distance greater than 800 kilometers for eleven ministries and departments. /Signed by Deputy Minister V. Gin'ko/

The USSR Ministry of Power and Electrification feels that the article "Exceptions Without Rules" absolutely correctly describes the problem of making rational use of transport. The electric power stations, which are the largest consumers of fuel in the Soviet Union, are very interested in reducing the distance that fuel is transported and in eliminating cross hauls and in cutting transport expenditures. We are constantly working on this, both in planning and in executing the plan.

The transport of Donetsk coal to the central regions has been reduced in the past five years from 4.5 to 2.2 million tons; what is more, more than one and half million tons are transported by water using empty barges after they have been unloaded at the Ust'-Donetsk port. In the Tenth Five-Year Plan shipments of Kuznetsk coal by river transport increased from 4.5 to 6 million tons.

The ministry has drawn up for the Eleventh Five-Year Plan a program, which calls for a reduction in the transport of fuel to the European portion of the Soviet Union. It is planned to build atomic electric power stations and to switch several power stations to natural gas and to erect new electric power transmission lines from Siberia and the Kazakhstan SSR.

On 30 October 1980 the Interdepartmental Commission for introducing rationality in shipping under the USSR Gosplan studied the question of putting an end to transporting Donetsk coal to the Yaroslavskaya TETS-2 [thermal electric power station] and the Igumnovskaya TETS. It was decided in 1981 to reduce the shipping to the Yaroslavskaya TETS-2 by 200,000 tons, and in 1982 to completely stop such shipments. In 1983 Donetsk coal will no longer be shipped to the Igumnovskaya TETS.

To eliminate excessively long-distance shipments of precast reinforced concrete, which was also mention in the article, the Ministry of Power and Electrification has been empowered to create in the Orgenergostroy [Institute for the Organization of Power Construction] Institute a special department to introduce rationality in shipments of construction materials. All enterprises, which manufacture precast reinforced concrete, have been given instructions to prepare measures aimed at reducing shipments, including the exchange of product with other ministries and departments. Freight flows of precast reinforced concrete are being drawn up for 1981. [Signed by Deputy Minister V. Budennyy]

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CSO: 1822/100

## SHORTCOMINGS IN USSR MINISTRY OF COAL INDUSTRY DISCUSSED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 10 Sep 80 p 2

/Article by V. Nikitin, USSR first deputy minister of the coal industry:  
"V. Nikitin Responds to SOTSIALISTICHESKAYA INDUSTRIYA"/

/Text/ The USSR Ministry of the Coal Industry has studied the article "A Repeat of What Has Already Been Covered", which was published in SOTSIALISTICHESKAYA INDUSTRIYA on 5 June 1980, and consider it to be correct.

The reasons for the slow development of hydraulic coal mining in recent years have been the lack of a machine building base to manufacture the special hydraulic equipment in adequate amounts and the inadequate capacity of the mine construction organizations of the Gidrougol' /hydraulic coal mining/ Association.

At the machine building plants of the USSR Ministry of Heavy and Transport Machine Building the assignments to organize specialized shops and to manufacture machinery for the hydraulic mining of coal were not fulfilled. As a result the hydraulic mines need basic equipment: coal pumps, pumps, hydraulic monitors, and high-pressure gear. Currently the requirement for such equipment is being met by less than half. In view of this, the USSR Ministry of the Coal Industry was forced to organize the production of some kinds of equipment at its own experimental and ore-repair plants to the detriment of their primary tasks.

To bolster the construction base of the Gidrougol' Association in 1979 the Gidrougostroy Trust /hydraulic coal mining construction trust/ was created. There are also plans to significantly increase the amount of construction and installation work performed by the enterprises of the association using its own resources.

As regards the modernization of the Kuznetskaya dressing mill, this work will be completed in 1980-1981, which will make it possible to sharply improve the quality of the clarification of the water that is directed into the Yubileynaya Mine to the hydromonitors. At this mine they are rapidly developing and preparing an additional unit with a production capacity of two million tons a year at the Antonovsko-Yesaul'skiy geological section. During the construction of the unit, a

limited amount of mining is being done. The use of the "dry" method of extraction here is temporary: until the completion in 1983 of the construction of the coal-pump hydraulic handling equipment and the main pulp line to the Kuznetskaya dressing mill.

The ministry is planning in the near future to increase the amount of hydraulic coal mining in the Kuznetsk Basin. To accomplish this, existing hydraulic mines will be modernized and several mines will be switched to hydraulic extraction. This includes mines such as the Tyrganskaya in Prokop'evsk, which have complicated mining and geological conditions for the usual technology.

In order to significantly increase the amount of coal that is extracted using the hydraulic method in the future, work has been undertaken to create experimental-industrial sections for hydraulic extraction at coal-bearing fields of the planned large hydraulic mines (Antonovskaya, Il'inskaya and others).

To improve the work of the existing hydraulic mines and to further expand the amounts of coal extraction using the hydraulic method, the USSR Ministry of the Coal Industry is asking the USSR Gosplan to solve problems connected with increasing the production of special equipment (coal-pumps and pumps with electric motors, hydromonitors and pipeline fittings), which are manufactured at plants of the USSR Ministry of Heavy and Transport Machine Building.

8927  
CSO: 1822

PROBLEMS OF MAKING INTEGRATED USE OF MINERALS DISCUSSED

Kiev RABOCHAYA GAZETA in Russian 27 Jan 81 p 2

[Article by Deputy Chairman of UkrSSR Gosplan A. I. Zhukov: "Use Mineral Resources in Integrated Fashion"]

[Text] During these days of nationwide discussion of the draft of the "Basic Directions" and of active preparation for the 26th CPSU Congress, many papers and letters from workers come to the editorial office with suggestions, comments and additions to the draft. At the same time, our readers' thoughts are aimed at applying the party document's principles and requirements more rapidly and more effectively in our daily national economic activities and in other spheres of social life.

As the editors' mailbox shows, the articles discussing the draft that were published are being examined attentively and are being studied in ministries and agencies, at enterprises and institutions, in party and soviet organs, and in other social organizations. Concrete measures are being taken in accordance with them and they are being used to develop current and long-range plans.

The editorial board opens up the heading, "From Recommendations to Action," with today's publication, under which will be placed communications about the activity of workers who speak out during discussions of the draft of the "Basic Directions" for the country's economic and social development.

Deputy chairman of UkrSSR Gosplan A. I. Zhukov responds to the article by Chief of the Mineral Resources Section of the UkrSSR Ministry of Geology Ya. Te. Belous, "Save the Earth's Riches," which was published on 5 December 1980 and mentioned the need to develop and intensify the integrated use of deposits of useful minerals.

Ya. Te. Belous's article touched upon a number of important problems. Actually, the rapid pace of development of the Ukrainian SSR's economy is being accompanied by an increasingly intensive use of mineral resources. This places on the agenda the task of more effective, integrated assimilation of natural mineral resources. Its solution is associated with a complicated system of technical organization and

technological and economic measures at the stage of exploration for reserves and the design of enterprises, with the introduction of more improved mining machinery and equipment and of new technological schemes for working deposits, and with the prevention or restriction of negative effects on the environment.

During the 10th Five-Year Plan, UkrSSR Ministry of Geology geological organizations and other agencies supported an integrated study of deposits of iron ores, nonferrous and rare metals, kaolins and other useful minerals. This will permit the design of multiple-branch mining and ore-treatment enterprises to be planned with technology that produces little or no waste. The Kremenchug region, where, during the Ninth and Tenth five-year plans, a new mineral raw-materials base for ferrous metallurgy and the building-materials industry was created, is an example.

Definite experience was gained not only in the integrated study but also in the integrated use of deposits. At some underground coal mines of the Donbass [Donets Coal Basin], the combustion of methane in boilers was arranged for, which, even at the achieved level of consumption thereof, will save more than 170,000 tons of fuel per year. Rock of mine dumps and tailings of coal-preparation plants are being used to make brick, porous agglomerate and keramzit.

Krivbass [Krivoy Rog Coal Basin] mining and concentrating combines each year produce up to 2 million m<sup>3</sup> of construction gravel made of country rock. At the Upper Dnepr Mining and Metallurgical Combine, almost completely wastefree production was organized for the mining and processing of titanium-zirconium alluvial deposits. During the processing of kaolin, the accompanying quartz-feldspathic concentrates are used. The UkrSSR Ministry of Construction Materials Industry is processing raw materials in integrated fashion at 102 deposits. In particular, artificial sand is produced from rock and waste, and the ordinary screenings are realized. The product of the country rock and waste make up 8 percent of the total output of building materials at this ministry's enterprises.

However, as the newspaper correctly emphasized, there are considerable deficiencies in the integrated study and use of mineral raw materials. A substantial number of previously explored deposits of useful minerals have not been properly studied and are not being mastered at all at present. Solving this problem will enable reserves of the mineral raw-materials base to be expanded, the expropriation of land for national economic needs to be reduced, and unpleasantness of the landscape and pollution of the environment to be lessened. Thanks to the use of mining industry tailings alone, the requirements of many branches of industry for quarried-type raw materials can be satisfied, and the production of fluxing agents, refractories, molding materials and raw materials for agricultural fertilizers, feldspars and abrasives can be increased.

UkrSSR Gospi has prepared an interindustry program of scientific research. The creation and mastery of industrial processes that are wastefree or nearly so and of new equipment that calls for the integrated use of mineral raw-material reserves and of production waste in branches of the Ukraine's economy are specified. Scientific research and experimental design will be expanded in the republic in the area of new systems for operating deposits, with the maximum conversion to the filling up of excavated space and to the soilfree protection of mining excavations, and in the area of introducing new and highly effective mining and concentrating equipment and new technology and reactants for improving processes for concentrating and increasing the extraction of valuable components from raw materials.

Moreover, in accordance with the specific Energokompleks (Power-Engineering Complex) program, research is being expanded on the more effective use of explored oil and gas reserves, on the creation of new methods and means for stimulating oil formations with a view to increasing withdrawal therefrom by 10-15 percent, and, on further reductions in losses of oil and gas during recovery, treatment and refining. According to plans that have been developed, the average coefficient for oil withdrawal will be 0.37 for Ukrainian SSR fields (let us note, in passing, that it is 0.33 for USA deposits, 0.36 for Canadian deposits).

Along with the traditional methods for stimulating oil formations, by means of which the Ukraine is to recover more than 50 percent of all oil, new and more effective methods are being developed: the flooding of deposits with the use of surfactants and alkaline solutions, steam thermal stimulation, in-situ combustion, and a solution of oil with water at a temperature of more than 300 degrees and a pressure of 160 atmospheres.

As for the involvement of industrial assimilation of useful mineral deposits that have already been explored, UkrSSR Gosplan reports on the facilities specifically named in the article:

In the Azov area, aside from the Mariupol'skoye deposit, the Kuksungurskoye, Korsakskoye and Gulyaypol'skoye iron-ore deposits, which enlarge the mineral raw-materials base for ferrous metallurgy of this region severalfold, have been discovered and are being explored. Therefore, the option of creating a large Azov GOK [mining and concentrating combine] that is based upon these products, with, roughly, a productivity of 48 million tons of raw ore per year, is preferable.

Yuzhgiproruda [State All-Union Institute for the Design of Enterprises for the Iron Ore, Manganese and Fluxing Materials Industry, for Industrial Refractory Raw Materials and for Fluorspar] has completed the technical and economic substantiation for development of the mining of manganese ores of the Bol'shetokmakskoye deposit. A board has been created for the Tavricheskoye GOK. Introduction of an industrial-test underground mine with a productivity of 2 million tons of ore per year is contemplated for 1985.

Technical and economic analyses have established that introduction into operation of the rich balanced ores of the Pokrovo-Kireyevskiy fluorite deposit is not desirable economically (the period for recouping capital investment will run past the date of exhaustion of the reserves). But now the possibility of involving lean ores in the operation, including ores that are balanced in content, based upon the integrated use of both the estimated fluorites and the limestone mixed in with them, is being studied.

In considering the complicated nature of the Beganskoye deposit, the question of exploiting the barites will be solved after the completion of exploration thereof and of industrial research concerning the other useful minerals.

A peculiarity of geological exploration is that it often solves questions of meeting tomorrow's requirements. From this point of view, the newspaper raises the problems correctly. Questions of the integrated, rational use of deposits are of great national economic importance. And they will find their solution during realization of plans for the 11th Five-Year Plan period.

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## FUELS

### BULGARIAN PAPER ON METAL-BEARING OIL IN USSR

Sofia ZEMEDELSKO ZNAME in Bulgarian 16 Feb 81 p 7

[Comment by Venelin Velev, specialist at the enterprise for geophysical studies and geological mapping in Sofia: "Tass Report: For the First Time in the World Metal-Bearing Petroleum"]

[Text] The announcement that metal-bearing petroleum, something previously unknown, has been extracted has triggered the interest of not only scientists and specialists. At the beginning of January 1981 the news agencies reported the following:

"The industrial extraction of a petroleum with an unusual composition has been undertaken on the eastern shore of the Caspian Sea, on Buzachi Island. Specialists discovered in the petroleum substantial quantities of vanadium, a metal extensively used in the manufacturing of steel alloys."

In order to obtain a more detailed explanation we turned to Venelin Velev, candidate of geophysical and mining sciences of the enterprise for geophysical studies and geological mapping in Sofia, who stated the following:

"Most of the various organic substances found in petroleum belong to various types of hydrocarbons--methane, naphtha and aromatic. That is why the main basic components of the petroleum phase are carbon (83-87 percent) and hydrogen (11-14 percent). In addition to the hydrocarbons, natural petroleum has secondary organic and inorganic components. Specialists have regularly identified within these products the existence of sulfur, oxygen and nitrogen. Other metallic or nonmetallic elements are found in limited amounts (usually 0.1 percent) concentrated in the resinous and tar petroleum fractions. As a result of the burning of the petroleum a small amount of ash is formed measured in terms of hundredths or tenths of one percent. This ash contains oxides of iron, aluminum, calcium, sodium, vanadium, nickel, manganese, cobalt, uranium and others. These elements (more than 20 of them) are found in the petroleum in the form of some specific metalorganic compounds or salts of different organic acids. From the organic and technological viewpoints any element other than carbon and hydrogen is considered unnecessary or harmful.

"Particularly harmful components include vanadium (discovered by the Soviet specialists in large amounts in the metal-bearing oil) and sulfur, whose compounds

act as highly corrosive agents affecting the ceramic and metal parts of furnaces, gas turbine engines and internal combustion engines. They are also powerful "toxic agents" of the catalysts used in petroleum refining.

"The origin of the so-called 'microelements' and the means through which they are used in the oil vary. Some of them are part of the petroleum phase at its very beginning, while others are added in the course of the various steps in the migration of this 'roaming' product (mainly from the rock water which enters into contact with the petroleum). Depending on the conditions in which the oil is formed and the characteristics of the geochemical environment, in the course of its migration in the petroleum phase, a variety of microelements may accumulate. In the advanced petroleum extracting countries the breakdown of the microelements in the ash residue of the petroleum is being extensively studied by specialists who can thus reconstruct the conditions under which the generation and accumulation of products in petroleum deposits may be reconstructed.

"It is entirely possible," Comrade Velev added, "that the ash content of some types of petroleum may be used as a raw material for precious metals." At the sixth interdepartmental seminar on problems of organic substances in natural residues, held in Moscow, the decision was made to pay greater attention to the study of metalorganic complexes in natural bitumens and petroleum, for in the past several years the existence of a high metal concentration, suitable for industrial extraction, was noted in such complexes.

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## FUELS

### MAJOR FAULTS IN BUILDING UP FAR NORTH'S GAS FIELDS NAMED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 29 Jan 81 p 2

[Article by V. Dinkov, first deputy minister of Gas Industry: "Siberia's Gas Complex"]

[Text] Last year 435 million m<sup>3</sup> of natural gas were extracted from our country's underground stores. Thus the upper limit that had been planned by 25th CPSU decisions for the industry at the end of the 10th Five-Year Plan was reached. And altogether during these years gas-industry workers recovered more than 1.5 trillion m<sup>3</sup> of gas--1.5-fold more than during the preceding five-year period.

Such a rapid pace of development was made possible thanks greatly to the successes of the geological explorers. In the North of Tyumenskaya Oblast, under the boundless swamps and permafrost, more than 50 large fields of the "blue fuel" have been found, among which are the unique Urengoy, Yamburg, Zapolyarnoye and Medvezh'ye. More than 8 percent of the All-Union growth in gas output was obtained here during the last five-year plan.

A firm raw-materials base will enable accelerated development of the gas industry to be planned many years ahead. This is why the party's decisions call for a considerable improvement in the country's fuel and power base by an increase in the recovery of gas and by substituting it for mazut on a wide scale.

The draft of the "Main Directions" contemplates that gas recovery in the country will be brought up to 600-640 billion m<sup>3</sup> in 1985--330-370 billion m<sup>3</sup> of it in West Siberia. Tyumen' will yield the country's entire increase in gas recovery during the 11th Five-Year Plan.

For this purpose, it is required that the amount of work done in all elements of the gas industry be increased. It is necessary to construct under the most difficult climatic conditions about 20 installations for the integrated treatment of gas and gas condensate and more than 100 high-powered compressor stations and to lay new gas arterial pipelines. During the new five-year plan the development of deep-lying deposits of gas-condensate deposits will have to be organized in order to recover this most valuable raw material.

Right now a large-scale program for the boosted development of West Siberia's gas industry is being prepared. This target is set: find those technical and organizational solutions that will enable not only an increase in the recovery of Tyumen'

gas to be made rapidly but also with maximum effectiveness from the standpoint of the national economy. For this purpose a number of problems must be solved.

One of the most severe questions of mastering the North remains the lack of roads, primarily roads within the gas fields and roads along pipeline routes. The Ministry of Transport Construction, in our view, is not working energetically enough in this area. Just a few hard-topped roads have been built at the great Medvezh'ye and Urengoy fields. As a result, equipment and materials for those who drill into the earth and for the builders and the oilfield operators have to be imported over winter-type roads, on which tens of millions of rubles are spent each year. In the summer all reliance is placed on helicopters alone.

It is perfectly clear that, without reliable transport lines to the Urengoy and other fields, it will be practically impossible to support timely drilling of the required number of wells, to supply operating equipment for compressor stations, and to support round-the-year construction of trunk gas pipelines. Meanwhile, Mintransstroy [Ministry of Transport Construction] still has not concentrated enough construction capacity in West Siberia. Only in this way is it possible to explain the systematic nonfulfillment of the goals for road construction. The lack of roads triples costs for the operation of production facilities.

Neither is the potential of river transport for delivering cargo to the North being used with complete adequacy. During the five-year plan, Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Facilities] and Mintransstroy subunits did not build even one of the tens of large river docks that had been planned. At the port of Sergino a new mechanized dock has been under construction for 7 years now, and the end is not even in sight. And so, instead of importing pipe along the rivers, tandem trailer trucks tackle the difficult path along the taiga's winter-type roads, sometimes for many hundreds of kilometers.

An urgent solution is also required to the problem of a reliable energy supply for the North's gas fields. At present the entire power-engineering system for the district's gas industry consists of more than 500 small power stations, a substantial portion of which operate on imported fuel. Because of the lack of electric power, highly productive drill rigs at Urengoy that work on electric drive stand idle, and the drillers are forced to use diesel drive.

Construction of the LEP-500 [500-kV electric-power transmission line] from the Surgutskaya GRES to Urengoy has been drawn out. But even when this line comes to the Arctic area, the deficit of electricity here will not be completely eliminated. Because of this, the question arises: is it economical "to bring firewood into the forest?" That is, to transport gas from Urengoy over 600 km to the Surgutskaya GRES, so that the energy can be returned to the gas field in the form of electricity? The first power block of the Urengoyskaya TETs could cover completely the requirements of the gas-rich North for electricity by the end of the new five-year plan. However, Minenergo [Ministry of Power and Electrification] has postponed its construction until the 12th Five-Year Plan.

In considering the importance of growth of West Siberia's gas industry, it would be judicious to define in the "Basic Directions" specific tasks for developing the transportation grid and tasks in the field of electric-power engineering for the district. This will enable the pace of mastering the gas fields to be sharply raised and labor and material resources to be saved.

Solution of the major tasks that face the industry depend greatly upon how well it is supplied with new and highly effective equipment. Improved automated modular installations for treating gas and gas condensate are to be introduced at Siberia's gas fields. More productive equipment has also been created for compressor stations. These include primarily full-delivery boosters with a high efficiency factor. Gas-turbine installations of 10,000-kw capacity can be coupled with such boosters. The use of units with the new boosters will enable the labor intensive-ness of compressor-station construction to be reduced 25-30 percent and the con-sumption of shut-off fixtures, thick-walled pipe and connecting parts to be halved. The economic benefit from introducing just one such booster in Siberia is about 500,000 rubles. During the 11th Five-Year Plan, it is planned to install about 500 such units in Tyumenskaya Oblast.

Vigorous development of Siberia's gas industry and an increase in equipment provi-sioning requires that highly skilled specialists be recruited for this severe dis-trict. For this purpose, well-arranged housing is needed most of all. However, our main contractors--Minneftegazstroy subunits--are not showing the proper concern about introducing into operation industrial facilities that are complete with hous-ing and personal-amenity facilities, and they are not developing capacity for building housing.

Last year, when the plan called for 140,000 m<sup>2</sup> of living space, the Tyumen' North's gas-field workers received about 100,000. The young cities of Nadym and Novyy Urengoy are being built up at an extremely slow pace.

As is known, energetic measures are now being taken to make up for what was neglec-ted in preceding years. Construction workers have been recruited from other parts of the country to erect housing and cultural and personal-amenity facilities. This timely step will be of good assistance to Siberia's gas-field workers. But it would be incorrect, in solving the housing problem, to count on help only "from outside." Both the contractors and the client--Tyumengazprom [Tyumen' Gas Industry Association]--must change decisively their attitude toward nonproduction construc-tion operations.

The work that lies ahead will be major and complicated. In order to solve the problems that have been touched upon here, a specific-program approach to manage-ment of the vast activity of Siberia's gas complex is necessary. This why it would be desirable to write in the part of the "Basic Directions" that is dedicated to development of the gas industry: "Complete the development of and proceed with the practical execution of an integrated specific-purpose program for a boosted in-crease in the recovery of natural gas in West Siberia."

These days a persistent drive for successful fulfillment of high precongress com-mittments is going on at the gas fields. Inspired by Comrade L. I. Brezhnev's greetings to the collectives of oilfield and gas-field workers and construction workers and to all workers engaged in developing Tyumenskaya Oblast's oil and gas industry, the industry's workers have been promoting broad socialist competition. By the day the 26th CPSU Congress opens, hundreds of millions of cubic meters of natural gas above the plan will have been recovered. West Siberia's gas-field workers are making a most meaningful contribution to above-plan recovery.

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## FUELS

### STATUS, PROSPECTS FOR FIFTH URENGOY GAS PIPELINE

Moscow PRAVDA in Russian 27 Jan 81 p 2

[Article by V. Lisin and V. Parfenov (Tyumen'-Moscow): "Siberia's Gas Arteries"]

[Text] The tundra stretches for hundreds of kilometers in all directions where the great Ob', as if tired from running northward to the Arctic Ocean, smoothly turns to the east and is transformed into a sea, named the Ob' Gulf. It is here, under the reindeer-moss swamps and permafrost, that Soviet geologists discovered gigantic natural gas fields. The Medvezh'ye, Urengoy and Yamburgskoye are the three main fields. For more than a year now, amid snow on the grounds of the first one, pipes have been shining like silver, and the plants that clean the recovered gas and send it into underground arterials, which fan out like rays to the south and west, have been humming resolutely.

The "multistoried" Urengoy field, of still greater capacity, spreads out its giant shoulders. And next, the most northerly and the most difficult, is the Yamburgskoye.

At the foothills of the Yamal, and in the area between the Pura and Taza rivers, and at other fields of the Tyumen' North, 330-370 billion m<sup>3</sup> of gas will be recovered by the end of the current five-year plan--more than half of nationwide gas recovery in 1985.

In order to transport such gigantic amounts of raw materials and fuel to the country's industrial regions and cities, in addition to the four existing pipelines, five or six more gas pipelines that are of higher capacity, and, the main thing, are longer, must be laid. Indeed, the average distance for transporting gas increases each year.

The increase in the share of North Siberia's gas in nationwide recovery thereof sharply increases the significance of developing the country's fuel and power complex and of constructing superlong-range gas arterials. It is the rapid pace of laying pipelines that will determine decisively the effectiveness of execution of the programs contemplated.

#### 1. The Fifth Ray from Urengoy

One of the most important construction projects of the first year of the new five-year plan for the creators of the country's gas arteries is a fifth ray, which

should link Urengoy with Moscow. It will be 2,800 km long. The route from Urengoy lies first in the North of Tyumen' and then it crosses the Komi ASSR and Arkhangelskaya, Vologodskaya, Yaroslavskaya, Vladimirskaya and Moscow Oblasts. After construction is completed, about 100 million m<sup>3</sup> of gas will be sent over it daily!

On 25 January the route's builders had already welded into a strand more than 2,200 km of pipe and had insulated and laid in the trench about 2,000 km. The builders of this gas pipeline have given their word to the motherland that they will complete the main operations for erection of the largest fuel and energy arterial by the 26th CPSU Congress.

How are things going on the route? The winter in the Tyumen' North right now has turned out to be warm: already it is the end of January but you do not freeze without a fur coat. Thank the construction workers and the vehicle drivers, even with a wolf howl: they laid the winter-type roads so reliably that you can cross the swamps and river with a real load and not fall through. But such a spineless winter runs against the builders' grain. Vladimir Mozharov, brigade leader of the welding and erecting column of Priob'truboprovodstroy [Ob' Pipeline Construction Trust] swears at it in vain. His brigade is laying the gas pipeline's steel strand not far from Igirim. The route's builders have built up a pretty good pace: they even worked two tractors there, whereas in severe cold they would have gotten by with one: in December they made 30 km. But in the swamp here they got stuck: the equipment sank in.

"It is difficult, of course, but we are keeping our word," V. Mozharov declared firmly.

And the welders in impervious leather coveralls who surrounded us confirmed these words. V. Mozharov's brigade is one of the best in this trust. There is a strong party group of six communists here who impart a high labor rhythm to the collective. And even the brigade leader himself—an experienced man—has for 12 years been building underground arterials. They had skillfully organized the training for the winter season, which came two weeks earlier than usual on the route.

During gas pipeline construction, one can often meet First Secretary of the Tyumen-skaya Oblast CPSU Committee G. Bogomyakov, First Deputy USSR Minister of Construction of Petroleum and Gas Industry Enterprises Yu. Batalin and USSR Deputy Minister of Gas Industry S. Kashirov. They examine objectively the progress of construction of the trunk line and coordinate responsively the forces of tens of subunits. The party committee of Minneftegazstroy sent Deputy Secretary of the Party Committee R. Avanesov to the route in order to strengthen work in the collectives. And the fact that there is no section on the construction project where people have not multiplied their contribution toward fulfilling the precongress socialist commitments testifies to the great work of the party committees and economic supervisors.

The difficulties are intensified by the fact that the gas pipeline crosses various natural and climatic zones with extremely complicated hydrogeological conditions: the polar tundra and the severe Northern Urals, and vast forested and swampy places. In the builders' path are more than 700 streams and other water obstacles, a multitude of railroads and highways, communication lines and high-voltage power-transmission lines.

A feature of the construction project is that the arterial will go into operation in sections—as they become ready. The gas pipeline is being built and operated

simultaneously. Fuel is already going over a segment of the pipeline that is almost 1,000 km in length. A section of the route several hundred kilometers long is being tested. Soon it will be switched in.

The Glavsbibtrudoprovodstroy [Main Administration for Pipeline Construction in Siberia] collective considers the Siberian section of the Urengoy-Center gas pipeline a shockwork section. Actually, the periods are very short. Indeed, the Kazym compressor station is to be released simultaneously for operation, something never before encountered in construction practice: the stations usually have been built a year or a year and a half later. That is why the main administration's best collectives are working on the route. The welding and erecting columns of B. Diduk, A. Rodionov and R. Ziyatdinov and the insulating columns of R. Kolodzey, V. Madenov, V. Volkov and others are moving ahead rapidly.

The Tyumen' builders know how to work skillfully in crashwork fashion. West Siberia has more than once been the motherland of All-Union records in laying underground arterials. The latest of these was established last winter by the brigade of USSR State Prize winner B. Diduk of Urengoytruboprovodstroy [Urengoy Pipeline Construction Trust]. It laid 125 km of large-diameter pipe during the season. Until recently this was within the capabilities only of entire administrations.

Boris Pavlovich Diduk is a welder still in his youth. He had built gas lines and gasholders before misfortune came: once a cable broke and crippled his arm, which the surgeons even wanted to amputate. He was then 26.

Another person would have left construction work: who wants a worker here with a disobedient arm? But it was not like B. Diduk to give up unceremoniously. He gave up in a little while his pension book for a second-category handicapped person and went to Taymyr--in the polar tundra. He built the world's most northerly gas pipeline, the Mossoyakha-Noril'sk. Then he laid the Central Asia-Central Economic Region gas arterial, and laid a steel strand to Kiev. And since 1973 arc welder B. Diduk has been toiling in the Tyumen' North.

"We decided to do 130 km this season," says B. Diduk. "The people understand the importance of the assigned task, and they are striving to greet our party's congress properly...."

...The construction workers along the whole Urengoy-Central Economic Region route had prepared strenuously for the winter season. Day and night they rehabilitated machines and mechanisms in the repair shops. The installers worked around the clock on the rotating welding stands, readying three-pipe sections, each of which was 35 meters long.

Last summer and autumn the builders cleared openings and sent pipe sections to the places of erection. Here and there welding of the steel strand proceeded. Road-building administrations cleared the route, put passages across streams and rivers, and built tens of kilometers of log roads.

But nevertheless, the warm time of the year, although it is important, is still only a preparatory period, when the main job is to send enough pipe to the basing point. This is not a simple matter. It relies on the unstable transportation systems of the Tyumen' North: the railroad is overloaded, and port activity on the

rivers is not well developed. These problems compelled the construction workers to seek new solutions. And the gas-route builders found them. Thus, during the summer large-diameter pipe was hauled by sea for the first time. During the navigation season more than 80,000 tons of this gas equipment was delivered for the fuel arterials that run from the North to the Central Economic Region.

The importance of the operation is great. The fact is that the freight used to be transshipped 5 to 10 times on its travel by railroad and rivers. This caused large expenditures of resources and time and inevitable damage to the pipe. Right now oceangoing dry-cargo ships are delivering the equipment to the Ob' Gulf. There it is reloaded onto river barges and sent to Nadym's docks. This transport scheme has saved about 5 million rubles.

However, even this does not completely satisfy the builders. Because they are seeking ways to improve this transport scheme, so that in the future they will ship at least 200,000 tons of large-diameter pipe during a navigation season. It is nevertheless important that the required amounts of pipe again were not shipped to the settlements of Beloyarskiy, Peregrebnoye and Igrim.

Equipment for a number of compressor stations still has not completely arrived. The collective of the Leningrad Metals Plant is greatly delaying the builders who are erecting the station in Vuktyl. Of the six turbine units that are required for a startup minimum, the Leningraders have sent only three. Yet they were supposed to send them during the third quarter of last year. Much remains to be done at the compressor stations in Sindor and Urdom. The turbines were not sent there on time from Uzhgorod. And so a major effort of the workers' relay is now required here!

The personal amenities have not been arranged for everywhere on the Urengoy-Central Economic Region arterial. The season for working on the route is at its climax, but in some of the temporary-duty settlements, mobile housing units, power plants, boilerhouses, equipment for dining rooms and many other things still have not been delivered. Each of the three trusts that are laying gas arterials in this corridor must have at least one MI-6 and there must be one MI-8 for the three of them. Unfortunately, the Tyumen' Civil Aviation Administration does not always completely satisfy the builders' requirements for rotary-wing equipment.

Interagency lack of coordination also is disturbing. Right now road-construction brigades are clearing forest for just one gas-pipeline route, but in advancing along it they could simultaneously be preparing a clearing also for the arterial to Petrovsk. For these gas pipelines will at first run parallel 15-20 meters from each other. But the local board for the future gas pipelines still has not issued felling permits, without which it is forbidden to fell trees for the second route.

Each evening Glavribroboprovodstroy specialists extend the red line on the diagram of the Urengoy-Central Economic Region gas pipeline, indicating the number of kilometers completed. Matters are going quite well, but time requires a still longer stride. And the people are ready for it if they are supplied with better equipment. On the route they are waiting for bulldozers, tractors, single-scoop excavators and vehicles to transport rotating personnel. This question requires a responsive decision.

The day is short in the Tyumen' North. Daylight scarcely arrives when it starts to darken again. Put Siberia's builders break through the Arctic darkness to open up a path to the country's center for a still larger flow of energy and light--natural gas from the famous Urengoy.

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